

NEWS REPORT

W W Gardner
NATIONAL ACADEMY OF SCIENCES
NATIONAL RESEARCH COUNCIL



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NEWS REPORT

National Academy of Sciences *National Research Council*

VOLUME VIII

November-December 1958

NUMBER 6

First International Congress of Radiation Research

HOWARD J. CURTIS

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and

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Oak Ridge National Laboratory

READERS of the New York Times and *NEWS REPORT* are aware that the Academy-Research Council, together with the Radiation Research Society and the University of Vermont, sponsored the First International Congress of Radiation Research. This Congress was held at Burlington, Vt., August 10-16 (See *NEWS REPORT*, Vol. VIII, pp. 87-88, 1958). Plans for the Congress, which attracted biologists, physicists, chemists, and medical research workers from all parts of the world, were formulated in close cooperation with the European Radiobiology Committee. The widespread interest in the meetings was gratifyingly reflected in the Congress membership and in the more than three hundred contributed papers, approximately 125 of which were delivered by scientists from nations other than the United States. Of the total registration of 841, 40 members came from the United Kingdom, 17 from Canada, 12 from Germany, 11 from Japan, 10 from Italy, 9 from Belgium, and 8 from the U. S. S. R. Altogether 25 countries were represented. This breadth of interest and diversity of

background contributed enormously to the success of the meetings.

There were four general topics which were widely discussed at the Congress and deserve special mention in reviewing the achievements of the Congress. The first of these is in the area of an understanding of the basic reaction between radiation and matter. It has been known for many years that the basic reactions, particularly in the biological field, must act largely through intermediate reactions primarily with water molecules, but the nature of these reactions has been poorly understood. Definite evidence is accumulating to indicate that these are free radical reactions, and it has even been possible by means of nuclear magnetic resonance spectrometry to detect the presence of free radicals in certain irradiated living cells. The presence of these free radicals has been associated with the biological damage.

The second topic which was closely associated with the first involved studies of substances which can protect living organisms against the harmful effects of radia-

tion. A wide variety of such compounds has now been synthesized and some of them have proven to be quite effective in reducing the lethal effects of radiation in not only bacteria, but also mice. The lethal action of radiation can be reduced by more than a factor of two by the use of some of these compounds in mice. The substances must still be administered to the mice only a very few minutes before the radiation is administered and are completely ineffective if administered afterward. The older theories as to the method of action of these protective substances seem no longer tenable. These postulated that the radiation made certain sites within a living cell especially vulnerable to oxidation, and that if a substance was added which significantly lowered the oxygen tension in the tissue, then the injured site could recover before it became oxidized. The newer ideas are that the protective substances are selectively bound to sensitive biological sites and thus protect these sites from the action of free radicals formed during the radiation. Other protective substances are apparently not so specific but act as general free radical traps.

The third area was that of the life-shortening effect of radiation in mammals. There is no question but that radiation decreases the life-expectancy of a mammal and that in very general terms an animal subjected to radiation will die sooner than he normally would, but will die of about the same causes as are found in natural aging. There is a good deal of controversy as to whether this is or is not a straight-line relationship with dose. This is essentially the problem of whether there is or is not a threshold for the production of radiation-induced aging. No definite threshold has been established but neither does the available data exclude the possibility of a threshold. The problem was not solved at the Congress and indeed may never be solved, but much new information was added to our existing knowledge in this area and the various viewpoints were forcefully presented.

Evidence was presented indicating that radiation-induced aging is almost unique in that an animal is apparently quite able to recover from many violent insults without

having his life-expectancy shortened thereby, but radiation apparently is an insult from which there is no complete recovery. Thus radiation cannot be considered as a generalized stress. One of the older concepts of aging, and especially radiation-induced aging, is that it is due to a gradual accumulation of mutations in the somatic cells of the body to the point where the various organs can no longer adequately perform their functions. Preliminary evidence was presented which would indicate this theory is no longer tenable.

The question of whether the various means which can be used to protect animals against the acute effects of radiation will also protect them against the aging effects of radiation has long been discussed. In the past there have been quite good experiments indicating both that the substances did and did not protect against the aging effects of radiation. At the Congress it became quite clear that, speaking in general terms, both the chemical and the biological (bone marrow) protective substances do indeed protect the animal both against the acute effects of radiation and against the aging effects. However, if one analyzes the causes of death in these cases it becomes apparent that the protective substances will protect some things much more than they will others. For example, one of the protective substances gave almost complete protection in mice against the formation of thymic lymphomas whereas it gave almost no protection against the induction of nephrosclerosis. Thus the analyses presented give us a much clearer picture of the long term effects of these substances and very beautifully clears up some of the discrepancies which have appeared in the literature.

The fourth field of interest was that of radiation genetics. It has long been assumed that radiation-induced mutations are "one hit" events and that when a gene is hit an irrevocable change is produced which is passed on to all subsequent generations. From this it would follow that radiation-induced mutations are strictly proportional to the radiation dose. A report of very extensive work with mice indicated that there is not a linear relation-

ship between mutation production and dose rate, but the low dose rates produce fewer mutations than would be expected. This makes our previous concepts very questionable. Since most of the earlier work was based on experiments done on lower forms, one is tempted to speculate that radiation-induced mutations in mammals depend upon other factors as well as on direct "hits." Since this also would be quite a serious departure from previous concepts it is doubtful if this helps much in resolving the dilemma.

The discussions in general were exceedingly fruitful, especially the informal exchange between individuals in the attractive surroundings of The University of Vermont campus. It was especially conducive to the exchange of views with our colleagues from Soviet Russia who either spoke English quite well or spoke to us through translators.

In its approach the Congress was definitely fundamental and less emphasis was put on the application of radiation to practical purposes, even though many of these discussions of course lead into this field in the final analysis. A typical case was the discussion on radiation protection and the recovery where 39 papers were given in

three different sessions and which was concluded with an open round-table discussion where clinicians and basic investigators exchanged views. The discussions on the importance of hydrogen peroxide in radiation research, from its production in water to its role in free radical production and its function in the biological effects of radiation provided another excellent example of getting physicists, chemists, physicians, and biologists together.

The complete proceedings will appear early in 1959 in a special volume which will be published by Academic Press.

With the possible exception of the meeting held at Oberlin College in 1950, which was sponsored by the Subcommittee on Radiobiology of the Division of Physical Sciences, no such comprehensive approach has been followed in meetings concerned with research in radiobiology. However, it was decided at this conference to hold such congresses every four years, and an ad hoc committee to consist of 12 investigators under the chairmanship of Dr. George de Hevesy, University of Stockholm, with Dr. Arne G. Forssberg, Institute of Radiophysics, Stockholm, as Secretary, was appointed to arrange for the next Congress in 1962.

Committee on Educational Policies in Biology

FRANK L. CAMPBELL

Executive Secretary, Division of Biology and Agriculture

FOR FOUR years, 1955-58, the Committee on Educational Policies was an important activity of the Division of Biology and Agriculture. It emerged from a conference on biological education (See *News Report*, Vol. 3, p. 42, 1953) that was convoked by Paul Weiss while he was Chairman of the Division and was launched under a small grant from the National Science Foundation. Soon thereafter the committee was assured three years of life

by a grant from a private foundation. Howard M. Phillips, then Dean of the Graduate School at Emory University, was named Chairman, and Richard E. Paulson, of the University of Chicago, was appointed Executive Secretary. The Committee was organized so that each member served as chairman of a subcommittee dealing with a particular aspect of biological education. The subcommittees and their chairmen were as follows:

PRECOLLEGE EDUCATION, TEACHER RECRUITMENT,
AND TEACHER EDUCATION, Claude S. Chadwick,
George Peabody College for Teachers
COLLEGE EDUCATION, Thomas S. Hall, Washington
University
GRADUATE AND PROFESSIONAL EDUCATION, Theophilus S. Painter, University of Texas
APPLIED BIOLOGY AND TECHNICAL SPECIALISTS,
Clyde H. Bailey, University of Minnesota
ADULT EDUCATION, Herbert R. Albrecht, Pennsylvania State University
INSTRUCTIONAL MATERIALS AND PUBLICATIONS,
John A. Behnke, Ronald Press Company

Later when a Biology Council was established in the Division to consider all factors affecting the development of biology in the United States, the Committee on Educational Policies became a committee of the Council, and Dr. Phillips became a Council member. When the Biology Council was terminated at the end of June 1957, the Committee on Educational Policies again became an independent committee of the Division and continued to work through June 1958 with sufficient support from the National Science Foundation to enable some of its reports to be published.

It was intended that each of the subcommittees of the Committee on Educational Policies should critically examine its particular area of interest and prepare for publication a report embodying its findings and recommendations. This was accomplished by the Subcommittee on College Education, and its report "Improving College Biology Teaching" (Academy-Research Council Pub. 505) is available through the Academy-Research Council Publications Office.

The Subcommittee on College Education also sponsored a conference on undergraduate curricula in the biological sciences, supported by a grant from the National Science Foundation (See NEWS REPORT Vol. 7, p. 22, 1957). The recommendations of this conference were published in September as Academy-Research Council Publication 578.

The Subcommittee on Instructional Materials and Publications was full of ideas for the improvement of biological education and with the help of the National Science Foundation initiated three important specific projects. Perhaps the most important of these was a project to provide directions for laboratory and field studies

in biology in secondary schools. This task was undertaken by selected high school and college teachers of biology who met at Michigan State University for 8 weeks in the summer of 1957 to work out laboratory and field exercises according to an outline that had previously been prepared by a panel on high school courses. This so-called writing conference produced a manuscript of 971 pages. Each exercise was prepared in two parts: one, directions and questions for the students; and the other, information for the teacher. This material was assembled and edited by C. A. Lawson and Richard E. Paulson. It was issued in mimeographed form under the title "Laboratory and Field Studies in Biology: A Sourcebook for Secondary Schools," provided with covers, and made available to about one hundred selected high schools for trial and evaluation. The comments and criticisms being currently received from teachers will be used for revision of the manuscript in preparation for conventional publication. Meanwhile, copies of the preliminary mimeographed edition may be purchased from the Publications Office of the Academy-Research Council.

A comparable project was initiated at the college level. Biologists throughout the United States were invited to submit their favorite laboratory exercises for possible inclusion in a series of college sourcebooks. A book for elementary biology was particularly desired and is being assembled. Contributions in physiology were turned over to the American Physiological Society to use in the preparation of a sourcebook in that field. Similarly, material in the field of microbiology was sent to a committee of the Society of American Bacteriologists for evaluation and possible use. Not enough material was received in other specialized fields to make the projected series complete.

The Subcommittee on Instructional Materials and Publications became interested in the teaching of specialized and advanced courses in biological subjects. Believing that the content of such courses should be periodically examined and revised, the Subcommittee established two panels to engage in a pilot study of two fields, systematic botany and parasitism. Meetings

of these two panels resulted in the publication of the following reports: "Suggested Outline for Teaching Systematic Botany," published in *Plant Science Bulletin*, Vol. 4, No. 1, pp. 1-3, 1958; and "An Approach Toward a Course in the Principles of Parasitism," in the *Journal of Parasitology*, Vol. 44, No. 1, pp. 28-46, 1958. The Subcommittee felt that these two experimental reports demonstrated the value of the method and that similar panels could make useful contributions to other fields in which biologists see the need for revision.

This same subcommittee also published a report on "Criteria for Preparation and Selection of Science Textbooks" in the *AIBS Bulletin*, Vol. 7, No. 5, pp. 26-28, 1957. Reprints of this report in leaflet form are available from the Publications Office.

The first general summary of the work of the Committee on Educational Policies was issued in July 1957 as a 62-page mimeographed report entitled "Advancing Biological Education: Recommendations and Activities of the Committee on Educational Policies, 1954-57." About 1,000 copies were distributed. A staff paper was also prepared on "Suggestions for a Comprehensive Program for Improving the Content of Biology Programs from Elementary School to College." This, too, was mimeographed and distributed to about 1,000 biologists and professional organizations in April 1958. Unfortunately by now all the reserve supply has been exhausted. It was the intention of Mr. Paulson to summarize the work of the Committee in a final publication entitled "Education and the Future of Biology." However, as exhaustion of funds brought the Committee's

work to an end on June 30, 1958, and as Mr. Paulson then became a member of the staff of the National Science Foundation, it may not be written.

Three more important publications in the field of biological education resulted from the efforts of Russell B. Stevens, formerly Executive Secretary of the Biology Council. He was the author of "Career Opportunities in Biology: The Challenge of the Life Sciences." Originally published by the Row Peterson Company of Chicago, this booklet is now being issued as Publication 552 in the Academy-Research Council series. Dr. Stevens also did most of the work on "Biological Education: A Partial Bibliography" (Academy-Research Council Pub. 518) and was co-editor of "Concepts of Biology" based on a conference sponsored by the Biology Council. First printed in *Behavioral Science* for April 1958, this report is now available from the Publications Office as Academy-Research Council Publication 560.

No attempt has been made in the foregoing outline to evaluate the work of the Committee on Educational Policies or to name the members of the subcommittees who furnished the ideas and opinions that led to the above-named publications. Certainly the Committee was one of the most dedicated and productive groups that had ever labored in this Division. Interest in biological education in the Division of Biology and Agriculture did not end with the termination of the Committee on Educational Policies. Some unfinished work of the Committee may yet be completed and published, and some new program in biological education may be set up.

SCIENCE NEWS

COMMITTEE ON ATMOSPHERIC SCIENCES

The Committee on Atmospheric Sciences met at the Academy-Research Council building on November 24. Representatives of interested government agencies, universities, and related Academy-Research Council Committees had been invited to attend. The Committee membership was enlarged by the addition of three scientists

from related fields: Fred L. Whipple, Smithsonian Astrophysical Observatory, Harvard University; Michael Ference, Jr., Science Laboratory, Ford Motor Company; and John Tukey, Princeton University.

The morning session was devoted to discussions of government interests and activities in the field of meteorological research

and related disciplines by representatives from the following U. S. Government Departments and Agencies:

ATOMIC ENERGY COMMISSION
DEPARTMENT OF AGRICULTURE
DEPARTMENT OF COMMERCE
DEPARTMENT OF DEFENSE
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
DEPARTMENT OF INTERIOR
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NATIONAL SCIENCE FOUNDATION
OFFICE OF THE SPECIAL ASSISTANT FOR SCIENCE AND TECHNOLOGY

The afternoon session was spent in a discussion of the major problems which have occupied the attention of the Committee on Atmospheric Sciences. These were linked to the need for basic research and education, and to the manpower and facilities required for adequate research efforts. Joining in the general discussion period were representatives of the University Committee on Atmospheric Research, the Academy-Research Council Committees on Oceanography and Polar Research, and the Space Science Board.

PAN AMERICAN GEOGRAPHY MEETINGS IN ECUADOR

Organized by the Commission on Geography of the Pan American Institute of Geography and History (PAIGH), the Fifth Pan American Consultation on Geography will be held in Quito, Ecuador, January 7-15, 1959, under the sponsorship of the Ecuadorian Government. The United States will be represented by an official delegation.

The Consultation is an inter-governmental scientific meeting and its technical agenda covers topics in the following fields: natural resources, climatic studies, land classification and use, geography of the Americas, the teaching of geography, population maps, and urban geography. The Commission on Geography will hold sessions during the course of the Consultation to handle internal matters. Clarence F. Jones of Northwestern University is the United States member on the Commission, with Charles B. Hitchcock of the American Geographical Society as alternate.

POSTDOCTORAL RESIDENT RESEARCH ASSOCIATESHIPS

The Academy-Research Council has announced that a program of postdoctoral resident research associateships will be offered for 1959-60 at the following laboratories:

NATIONAL BUREAU OF STANDARDS, Boulder, Colo., and Washington, D. C.
NAVAL ORDNANCE LABORATORY, White Oak, Silver Spring, Md.
NAVAL RESEARCH LABORATORY, Washington, D. C.
NAVY ELECTRONICS LABORATORY, San Diego, Calif.
U. S. ARMY CHEMICAL CORPS BIOLOGICAL WARFARE LABORATORIES, Fort Detrick, Frederick, Md.

The Air Research and Development Command of the U. S. Air Force is also participating in this program at four installations. These associateships are tenable at Air Force Cambridge Research Center, Bedford, Mass.; Air Force Missile Development Center, Alamogordo, N. Mex.; Rome Air Development Center, Rome, N. Y.; and Wright Air Development Center, Dayton, Ohio. In addition the Air Force Office of Scientific Research is sponsoring a program of postdoctoral university research associateships tenable at 21 universities in the United States.

The resident research associateships have been established to provide young scientists of unusual ability and promise an opportunity for advanced training in basic research in a variety of fields. Modern facilities are available in specified areas of the biological, physical, and mathematical sciences, and in engineering. In addition, research in certain areas of psychology is also available.

Applicants must be citizens of the United States. They must have training in one of the listed fields equivalent to that represented by the Ph.D. or Sc.D. degree and must have demonstrated superior ability for creative research. Remuneration is \$5,985-7,510 a year subject to income tax.

Descriptive brochures giving further details and application forms may be secured from the Fellowship Office, Academy-Research Council. In order to be considered for 1959-60 awards, applications must be filed on or before January 19, 1959. Awards will be announced by the participating laboratories and research centers.

NATIONAL CONFERENCE ON STAPHYLOCOCCAL DISEASE

In recent years, outbreaks of antibiotic-resistant staphylococcal disease have been reported with disturbing frequency from hospitals here and abroad. The old problem of infections acquired in hospitals, half forgotten during the era of antibiotics, has once more emerged as a major concern. Once again there is need for strenuous enforcement of aseptic and sanitary precautions, and for the development of new and more effective measures of control.

Following numerous discussions of the subject by their respective advisory groups, the Division of Medical Sciences and the U. S. Public Health Service jointly sponsored the first National Conference on Hospital-Acquired Staphylococcal Disease at the Public Health Service Communicable Disease Center in Atlanta, Ga., September 15-17. The Conference undertook to review present knowledge of the problem, to identify aspects that require further investigation, and to recommend practical measures for its solution. Its sessions were attended by delegates from 59 professional organizations and many others chosen for their expert knowledge in special fields.

The proceedings, containing the formal papers, discussions, and recommendations of the Conference, have been published by the Communicable Disease Center.

COMMITTEE ON BIO-ASTRONAUTICS

At the request of the military services, the Division of Medical Sciences has established the Armed Forces-National Research Council Committee on Bio-Astronautics under the chairmanship of Otto H. Schmitt of the University of Minnesota. The purposes of the Committee will be:

to acquaint scientific investigators with the military requirements for establishing space as an operational medium for man; to consider and report upon military problems related to manned space operations; to assist in providing scientists and military personnel with access to scientific and technical information pertaining to the bio-astronautical problems of life in space; to promote the exchange of research information on the bio-astronautical problems through such media as meetings, symposia, and forums; to stimulate research on all problems of life in space where deficiencies of knowledge warrant special effort; to further the

science of bio-astronautics by encouraging the contribution of the many related fields of science; and to provide specific answers to specific problems posed by the Armed Forces.

The Executive Council of the Committee was appointed in October and held its first meeting in San Antonio, Tex., on November 10 in conjunction with the Second International Symposium on the Physics and Medicine of the Atmosphere and Space. Membership of the Council is as follows:

OTTO H. SCHMITT, University of Minnesota,
Chairman

MELVIN CALVIN, Radiation Laboratory, University
of California

HOWARD J. CURTIS, Brookhaven National Laboratory

PAUL M. FITTS, University of Michigan

BRIG. GEN. DON FLICKINGER, Air Research and
Development Command, U. S. Air Force

JOHN D. FRENCH, University of California at Los
Angeles

CAPT. CHARLES F. GELL, Special Assistant for
Medical and Allied Sciences, Office of Naval
Research

JAMES D. HARDY, Aviation Medicine Acceleration
Laboratory, U. S. Naval Air Development
Center

LT. COL. ROBERT H. HOLMES, Research and De-
velopment Command, Office of the Surgeon
General, U. S. Army

Ex-officio

LT. COL. CLARENCE CAIN, Air Research and De-
velopment Command, U. S. Air Force

R. KEITH CANNAN, Chairman, Division of Medical
Sciences

SAM F. SEELEY, Acting Executive Secretary of
the Committee

Patterned after existing Armed Forces-National Research Council committees in the fields of vision and bio-acoustics, the Committee will be governed by its Executive Council and will operate chiefly through working groups and consultants chosen for specific tasks. A larger membership, representing both military and civilian institutions, will participate in the symposia and contribute their talents as the need arises.

Discussion at the first meeting centered upon the composition of the Committee and upon the delineation of relationships with the Academy's Space Science Board and the advisory committees being established within the National Aeronautics and Space Administration.

COMMITTEE ON HEARING AND BIO-ACOUSTICS

The sixth annual meeting of the Armed Forces-National Research Council Committee on Hearing and Bio-Acoustics (CHABA) was held at the Academy-Research Council building on October 28 and 29 with between 80 and 90 persons in attendance including invited observers from Canada and Sweden. S. Douglas Cornell, Executive Officer of the Academy, opened the 2-day meeting, and W. Dewey Neff, Chairman of CHABA, presided over the sessions.

The program for the meeting consisted of panel discussions of four general topics, with ample time allotted for comments from the floor.

The first half-day was devoted to a preliminary report by Working Group 33 on the bio-acoustic aspects of rockets, missiles, and space travel. Led by J. C. R. Licklider of Bolt, Beranek, and Newman, Inc., chairman of the working group, the panel discussed the acoustical aspects of rocket launching and space travel and attempted to show where bio-acoustic problems might be expected and how serious they might be. The discussion covered the effects on rocket passengers of motor noise and aerodynamic noise upon launching and on re-entry, as well as acoustic problems in launching rockets from submarines, of machinery noise within the rocket, of speech communication during flight, of the spread of noise from the launching site, and the possible effects of rocket vibration on passengers during flight.

The report, in general, concluded that there are some bio-acoustic problems that will require attention. More acoustic data must be collected from missiles during launching, while in orbit, and during re-entry before the exact magnitude of the problem can be stated.

The second half-day session was devoted to discussions of aircraft noise, annoyance, and community response. This included a summary of jet engine flight noise suppressors, the presentation of a method for calculating "noisiness" which was supported by a demonstration tape of aircraft noises, and a discussion of some of the human factors underlying community reactions to Air Force noise. The session closed with a

review of continuing studies on the effects of high-intensity noise.

The third session dealt with monitoring hearing level, including the hearing levels in a controlled industrial population in Federal penitentiaries, the validity of single-frequency screening, and the hearing losses found in Reserve Forces Act trainees. An interim report from Working Group 32 discussed establishing criteria for exposure to impulse-type noises.

The general topic of the last half-day session was communication in noise. One taped demonstration illustrated the difficulties of radio-telephone voice communication in noise levels up to 150 decibels. A second taped demonstration of voice communications in noise described the Naval Electronics Laboratory's flight deck communication system. This was followed by a short talk on the criteria for noise control used in the U.S.S.R.

CONFERENCE ON AGRICULTURAL PESTS

On October 20 and 21, the Committee on Agricultural Pests for the first time held a joint meeting of its six subcommittees dealing with insects, plant diseases, nematodes, vertebrate pests, weeds, and biological control of soil-borne plant pathogens at the Academy-Research Council building. W. C. Dutton, chairman of the Committee and formerly associated with the Dow Chemical Co., presided.

At the opening session the work of the Academy-Research Council was reviewed briefly and the subcommittee members were informed that the purpose of the conference was to devise methods for and stimulate interest in accurate appraisal of losses caused by agricultural pests.

The subcommittees then met separately and reassembled jointly on the second day for summaries and recapitulations. The following subcommittee chairmen reported:

H. M. HARRIS, Iowa State College, *Insects*
A. L. TAYLOR, U. S. Department of Agriculture, *Nematodes*
J. R. SHAY, Purdue University, *Plant Diseases*
W. W. DYKSTRA, U. S. Fish and Wildlife Service, *Vertebrate Pests*
O. C. LEE, Purdue University, *Weeds*
W. C. SNYDER, University of California, *Biological Control of Soil-Borne Plant Pathogens*

RESEARCH CORRELATION CONFERENCE ON PAINTS AND COATINGS

Because paints and coatings have undergone greater changes than almost any other material used in building during the past 10 years, the Building Research Institute has arranged a Conference on Field Applied Paints and Coatings in order to bring these new developments to the attention of the interested public as well as those actively engaged in building construction. Scheduled for December 3 and 4 in Washington, D. C., the meeting will be sponsored by the National Paint, Varnish and Lacquer Association and the Painting and Decorating Contractors of America.

The main purpose of the conference is to point out the advantages and limitations of the many new materials used in modern paints and coatings. The future of these new materials and the most successful methods of application will be examined, as well as deteriorating influences on paints and coatings, the functional use of colors and the effects of color on paint and coating performance.

The major panel discussion with Francis Scofield of the National Paint, Varnish and Lacquer Association as chairman will be devoted to the economical use of paints and coatings within a building maintenance program.

Harry Ross Young, E. I. du Pont de Nemours and Company, Inc., is serving as chairman of the conference planning committee and will be chairman of the conference.

INTERNATIONAL UNION OF BIOLOGICAL SCIENCES THIRTEENTH GENERAL ASSEMBLY

The International Union of Biological Sciences (IUBS) held its 13th General Assembly at The Royal Society, Burlington House, London, July 12-14, with S. Hörstadius, President of the Union, presiding. The participants included national delegations from 25 of the 33 adhering countries, delegates from the 12 sections and various commissions of the Union, a number of invited observers, and representatives from the International Council of Scientific Unions (ICSU) and Unesco. The United States was represented by the fol-

lowing Academy-Research Council delegates: Kenneth B. Raper, University of Wisconsin, *Chairman*; Ralph E. Cleland, University of Indiana; and Viktor Hamburger, Washington University.

The Assembly opened with a welcoming address by Sir Cyril Hinshelwood, President of The Royal Society, followed by an expression of appreciation on behalf of the Union by President Hörstadius. From the reports of the sections, commissions, and permanent services of the Union submitted to the Assembly, it was evident that these agencies have been quite active in the past triennium and that much of significance to biology at the international level has been accomplished. The International Committee on Bacteriological Nomenclature has recently published "The International Code of Bacteriological Nomenclature," and the International Trust for Zoological Nomenclature was commended for the wide acceptance of its *Official Lists* and *Official Indexes* which are already self-supporting. Within the past 3 years, 15 publications have appeared as a result of international congresses and symposia sponsored by the constituent sections and commissions of the Union, and the Proceedings of 5 other international conferences are now in preparation.

To increase the much needed revenue of the Union the Assembly established a category of supporting members open to industries engaged in, or accessory to biological research and requested all IUBS national committees to endorse greater support for the Union from Unesco through ICSU.

In the discussion of future activities, special attention was given to the sponsorship of international congresses and symposia, one of the most important services rendered by IUBS to biology. A total of 14 international congresses are scheduled to be held under the auspices of the Union during the period 1958-62. Requests for sponsorship of 7 international symposia for 1959 were considered, only 4 of which could be given limited assistance, namely: microbial antigenicity, genetics, cell biology, and one symposium at the Botanical Congress in Montreal. Considerable discussion revolved around the question of

the frequency with which international congresses should be held. The general consensus favored a minimum of 5 years between such congresses, with regional symposia of more limited scope being held in the interim as needed.

Reports and discussions of organizational matters revealed a most impressive record of activity and accomplishment in the areas of education in biology at the international level, the preservation and cataloguing of zoological specimens, abstracting of biological publications, the care and standardization of laboratory animals, and documentation. The Assembly studied with great interest a report of the ICSU Abstracting Board on its work in the field of biology and expressed the hope that ICSU would continue this important task in collaboration with IUBS. Among actions taken was the decision to appoint two ad hoc committees, 1) to strive for clarification of differences in concepts and in terminology now employed in the international codes of botanical, zoological, and bacteriological nomenclature; and 2) to work toward the standardization of symbols used in biological literature and a uniform system for abbreviating titles of journals in bibliographies.

The Assembly elected the following officers and members of the Executive Committee for the term 1958-61:

G. MONTALENTI (Italy), *President*
S. HÖRSTADIUS (Sweden), *Immediate Past President*
P. CHOUPARD (France), *Vice President*
A. F. BRUNN (Denmark), *General Secretary*
R. ULRICH (France), *Secretary*
J. LANJOUW (The Netherlands), *Treasurer*
G. L. STEBBINS (United States), *Member*
J. G. BAER (Belgium), *Member*
M. J. CHEVREMONT (Belgium), *Member*

The invitation of the Netherlands delegation to hold the 14th General Assembly in Amsterdam in 1961 was unanimously accepted.

NEW FIRE RESEARCH PERIODICAL

The Committee on Fire Research announces the publication of a new periodical, *Fire Research Abstracts and Reviews* (Vol. 1, No. 1, September 1958) to be issued three times a year. Interested persons may obtain free copies by writing to the Committee.

AGRICULTURAL RESEARCH INSTITUTE ANNUAL MEETING

The seventh annual meeting of the Agricultural Research Institute was held at the Academy-Research Council building on October 13 and 14 with 148 registrants in attendance. The meeting opened Monday morning, October 13, with the presidential address of C. L. Rumberger, President of the Institute. The next speaker was Ralph W. Phillips, U. S. Department of Agriculture, whose topic was "Agricultural Research in Foreign Countries." A short business session and a panel discussion of problems in the fertilizer industry ended the morning session. Monday afternoon was devoted entirely to a panel discussion of public relations in agriculture and agriculture research. At the dinner meeting in the evening, Jim Low, National Association of Manufacturers, delivered the main address on "The Human in Public Relations."

The first half of the Tuesday morning session featured three speakers: W. E. Kraus, Chairman of the Agricultural Board, who reviewed the Board's work in 1957-58 and took a look into the future; B. T. Shaw, U. S. Department of Agriculture, who discussed the U. S. Department of Agriculture's pioneering laboratories on their first birthday; and Finis E. Engleman, American Association of School Administrators, who outlined the position of the American public school system in the modern scientific age. The remainder of the morning was given over to a panel discussion on mobilizing research for progress in soil and water conservation. This was essentially a report of a committee of the Agricultural Board, with each member discussing an assigned question, followed by a period of open discussion from the floor.

Tuesday afternoon the Institute held its final business meeting. Reports of all standing committees were presented and the following officers for the ensuing year were elected: Burt Johnson, National Cotton Council of America, *President*; C. H. Mahoney, National Canners Association, *Vice President*; and M. B. Gillis, International Minerals and Chemical Corporation, *Secretary*.

The panel participants according to the areas of discussion were as follows:

Problems Relating to Agriculture in the Fertilizer Producing Industry:

VINCENT SAUCHELLI, National Plant Food Institute, *Moderator*

M. B. GILLIS, International Minerals and Chemical Corporation

EDWIN COX, Chemist and Chemical Engineer

EUGENE D. CRITTENDER, Allied Chemical Corp.

Public Relations in Agriculture and Agricultural Research:

WALTER B. GARVER, U. S. Chamber of Commerce, *Moderator*

PHILIP M. WAGNER, *Baltimore (Md.) Sun*

BERNARD L. YUDAIN, *Time, Inc.*

MERLE E. WARD, E. I. du Pont de Nemours and Co.

C. L. RUMBERGER, Chairman, Committee on Public Relations in Agriculture

Mobilizing Research for Progress in Soil and Water Conservation:

JOHN F. TIMMONS, Chairman, Committee on Soil and Water Conservation

MARION CLAWSON, Resources for the Future, Inc.

LUNA LEOPOLD, U. S. Geological Survey

T. W. EDMINISTER, U. S. Department of Agriculture

H. A. STEELE, U. S. Department of Agriculture

R. J. MUCKENHIRN, Wisconsin Agricultural Experiment Station

**GRANTS-IN-AID OF RESEARCH
IN PROBLEMS OF SEX**

The Division of Medical Sciences is accepting applications for grants-in-aid of research in problems of sex. Funds for the support of this program are provided by the Rockefeller and Ford Foundations. The Committee for Research in Problems of Sex, which processes the applications, is concerned primarily with encouraging research on the mechanisms underlying sexual behavior, with special emphasis on the higher mammals and man. Proposals involving endocrinological, neurological, psychological, anthropological, phylogenetic, and genetic studies directed toward this objective will be accepted for review. Requests that deal with the physiology of reproduction or with related biological and biochemical fields should be addressed to the Committee only if they give promise of shedding light upon behavioral mechanisms. Applications for the fiscal year 1959-60 should be postmarked on or before January 15, 1959. Additional information may be obtained from the Division of Medical Sciences.

**FOOD AND NUTRITION BOARD
ANNUAL MEETING**

The 54th meeting of the Food and Nutrition Board was held at the Academy-Research Council building, October 31 and November 1, with Grace A. Goldsmith, Chairman of the Board, presiding. Guests of the Board on this occasion, were the members of the U. S. National Committee for the International Union of Nutritional Sciences and the Organizing Committee for the Fifth International Congress on Nutrition, which will be held in Washington, September 1-7, 1960. Two members of the Board, C. Glen King of the Nutrition Foundation Inc. and Paul György of Philadelphia General Hospital, are serving as President of the Congress and Chairman of the Organizing Committee, respectively.

W. H. Sebrell, Jr., of the Institute of Nutrition Sciences, Columbia University, Chairman of the Committee on Protein Malnutrition, reported on the results of a \$250,000 research program on the development of protein foods in food-deficient countries. This program, with funds provided by the Rockefeller Foundation, was coordinated with the international programs of United Nations Children's Fund (UNICEF), Food and Agriculture Organization (FAO), and World Health Organization (WHO).

The Board also previewed and approved for publication a report entitled "Evaluation of Protein Nutrition with Emphasis on Amino Acid Proportionalities," prepared by the Committee on Amino Acids under the chairmanship of James B. Allison, Bureau of Biological Research of Rutgers University. This report presents a comprehensive background for critical consideration of the addition of specific amino acids to cereal foods for improvement of protein quality.

A task group from the National Institute of Dental Research under the leadership of S. J. Kreshover, Associate Director of the Institute, asked the Board for counsel in a proposed study of dietary phosphates and dental caries to be conducted in cooperation with the U. S. Bureau of Indian Affairs Health Service.

William J. Darby, Vanderbilt University School of Medicine, apprised the Board of

the extensive work of the Food Protection Committee with reference to the 1958 amendment to the Federal Food Drug and Cosmetic Act. A report of the Committee entitled "Food Packaging Materials: Their Composition and Uses" was approved for publication.

A new committee has been organized by the Board to reconcile some of the conflicts of opinion on infant nutrition. Robert L. Jackson of the University of Missouri is serving as chairman.

With the publication of the 1958 revision of "Recommended Dietary Allowances," the Committee Chairman, Robert E. Shank of Washington University School of Medicine was relieved of further duties, and a new Committee on Dietary Allowances with Wendell H. Griffith, University of California Medical Center, as Chairman was nominated to look ahead to the next edition.

The Board also received oral reports from liaison representatives and guests on the work of the following agencies:

INTERDEPARTMENTAL COMMITTEE ON NUTRITION FOR NATIONAL DEFENSE, Arnold E. Schaefer, Executive Director

CANADIAN COUNCIL OF NUTRITION, E. W. McHenry, President of the Nutrition Society of Canada

AMERICAN MEDICAL ASSOCIATION COUNCIL ON FOODS AND NUTRITION, Philip L. White, American Medical Association

INSTITUT POUR LE RECHERCHE SCIENTIFIQUE EN AFRIQUE CENTRALE, Louis Van Den Berghe, Directeur.

At the dinner meeting on October 31, the main address was given by Raymund L. Zwemer, Office of the Science Adviser of the U. S. Department of State, on "The S in Unesco."

NATIONAL CONFERENCE ON HIGHWAYS AND URBAN DEVELOPMENT

More than fifty Federal and state highway officials, city administrators, planners, housing officials, educators, transit operators, and business and civic leaders attended the National Conference on Highways and Urban Development at Syracuse University Sagamore Conference Center, Raquette Lake, N. Y., October 5-9. The Conference was sponsored jointly by the Committee on Urban Research of the Highway Research Board, the American Municipal Associa-

tion, The American Association of State Highway Officials (AASHO) Joint Committee on Highways, and Syracuse University. In the course of the week-long meeting, a plan for coordinated action and research to obtain maximum benefits for both urban and rural communities from the gigantic United States roadbuilding program was agreed upon.

The findings and recommendations of the Conference were made public by A. E. Johnson, Executive Secretary of AASHO and General Chairman of the Conference. A detailed report to be published jointly by the sponsors is now being prepared.

The conferees discussed the tremendous impact that new highways are expected to have on local communities and their potential detrimental and beneficial effects. They identified a large number of problems and examined them from the points of view of the major groups affected. The conference discussions revealed instances in which local areas have developed effective machinery for cooperative efforts between state and local officials and community planners and other cases where no such cooperation exists.

The conference achieved several significant results:

- 1) It produced a clearer understanding of the complex relationships between urban development and the new highways and other forms of transportation needed to serve metropolitan areas now and in the future.
- 2) It gave clearer expression to the goals for community development and highway transportation services.
- 3) It reached general agreement on individual and joint responsibilities of state and local officials.
- 4) It produced a range of specific measures, including planning and research, that could be used to harmonize creatively our highways and urban development activities.
- 5) It established a basis for fruitful working relationships between planners and engineers, clarifying their respective roles in highway and local planning.
- 6) It gave unqualified support to an enlarged urban and regional planning effort.
- 7) It reached agreement on the need for enlarged comprehensive urban and regional research programs and recognized the contribution such research could make to action and planning programs.
- 8) It recognized the need to improve the education of planners and engineers and endorsed immediate short courses to more fully acquaint each with the concepts and methods of the other.

9) It gave promise that new public and private development will be used more creatively and imaginatively by responsible public and professional groups concerned.

10) The Conference identified a wide range of research needs and recommended that the Committee on Urban Research be designated to appraise these projects and establish priorities for them.

IGY ROCKETS OBSERVE A SOLAR ECLIPSE

The first rocket observations of a solar eclipse were successfully made on October 12 by an expedition to the Danger Islands (Pukapuka) of the Pacific as part of a project sponsored by the U. S. National Committee for the IGY.

Data telemetered from the rockets confirmed the belief that solar X-rays originate in the sun's outer atmosphere, or corona, while solar ultra-violet comes from its lower atmosphere, or chromosphere.

This conclusion was reported on October 28 at the Academy by Herbert Friedman, leader of a research rocket team from the Naval Research Laboratory (NRL) on the voyage. Other agencies participating in the expedition were the Central Radio Propagation Laboratory of the National Bureau of Standards, which took radio soundings of the ionosphere; and the University of Wisconsin, the California Academy of Sciences, the U. S. Naval Radiological Defense Laboratory, the Sacramento Peak Observatory, and the High Altitude Observatory, all of which conducted various types of optical experiments. The U. S. Navy provided the logistic support for the expedition, in which 32 scientists participated.

Cloud cover at the Danger Islands site interfered with the optical experiments. However, New Zealand scientists are reported to have obtained an unobstructed view of the eclipse from their base of operations at Atofu.

The NRL party fired five Nike-Asp rockets from the deck of a Navy ship before, during, and after the eclipse, four of them reaching desired altitudes of 139 to 150 miles. The data indicated that ultra-violet radiation diminished as the surface of the sun was obscured by the moon but that the intensity of X-rays was unaffected. The NRL group considered this the first

conclusive proof that the source of the X-radiation is the corona, which remained visible as a "halo" around the moon during the eclipse. The source of ultra-violet radiation, on the other hand, appears to lie within the solar disc.

The radio soundings during the eclipse were reflected by a continuing ionospheric layer, suggesting that the X-ray component of solar radiation must play a major part in the ionizing process.

SCIENTIFIC ATTACHES VISIT THE ACADEMY-RESEARCH COUNCIL

A luncheon in honor of the scientific officers of the diplomatic corps in Washington was held in the Great Hall of the Academy-Research Council building on November 25, under the auspices of the Office of International Relations. Wallace W. Atwood, Jr., Director of the Office, presided at this official, informal affair.

The purpose of the luncheon was two-fold: 1) to get better acquainted with one another and 2) to discuss some of the activities of the Academy-Research Council in which the scientific attaches had expressed particular interest.

In his capacity as toastmaster, Dr. Atwood introduced the science representatives from 24 countries, the U. S. Department of State, the National Science Foundation, the President's Science Advisory Committee, and members of the various offices and divisions of the Academy-Research Council. The following countries were represented:

Australia	The Netherlands
Belgium	Norway
Canada	Poland
Czechoslovakia	Rumania
France	Sweden
Germany	Switzerland
Great Britain	Turkey
Greece	Union of South Africa
India	Union of Soviet Socialist
Ireland	Republics
Israel	United Arab Republic
Italy	Yugoslavia
Japan	

H. P. Robertson, Foreign Secretary of the Academy, welcomed the guests. Douglas S. Cornell, Executive Officer, discussed the history, organization, and functions of the Academy-Research Council. Commenting on the internal mechanism of the Office of

International Relations and on some of the projects now in progress, were Andre C. Simonpietri, Associate Director of the Office, E. C. Rowan, Assistant Director of the Office, and Hugh Odishaw, Executive Director of the U. S. National Committee for the International Geophysical Year.

U. S. NATIONAL COMMITTEE INTERNATIONAL SCIENTIFIC RADIO UNION

The U. S. National Committee of the International Scientific Radio Union (URSI) held its fall meeting, October 20-22, at Pennsylvania State University with 275 registrants in attendance. The program consisted of a technical session of invited papers and a series of sessions organized by Commissions 2, 3, 4, and 6.

Commission 3 devoted one session to a symposium on "The Use of Space Vehicles." The discussion dealt with experiments designed to be placed in an earth satellite to measure such quantities as field intensities, ionization densities in the satellite orbit, and Faraday rotation through the ionosphere. Experiments of a type that can be carried out in the immediate future and some that will become possible much later as satellite technology advances were also considered.

K. M. Siegel and F. T. Haddock of the University of Michigan reported on the Paris and Moscow meetings of the International Astronomical Union. Paul Green of Lincoln Laboratory discussed the work of Soviet scientists in the field of information theory.

In addition to the technical sessions, the National Committee and the Commissions held a series of business meetings. The National Committee accepted an invitation to hold its 1959 fall meeting in San Diego, Calif. Planning for the next General Assembly of URSI to be held at University College of the University of London, September 5-15, 1960, was also initiated.

The spring meeting of the U. S. National Committee was scheduled for May 4-7, 1959, in Washington, D. C. All arrangements for the meeting are being handled by a local committee under the chairmanship of Kenneth S. Kelleher, President of the Aero Geo Astro Corporation, Alexandria, Va.

COMMITTEE ON UNDERSEA WARFARE

On Tuesday, September 9, three members of the Committee on Undersea Warfare were honored for their outstanding contributions to the U. S. Department of the Navy in the field of scientific research and development. At an informal dinner held at the Cosmos Club in Washington, Adm. Arleigh A. Burke, Chief of Naval Operations, presented Navy Distinguished Public Service Awards to Eric A. Walker, President of Pennsylvania State University, and Gaylord P. Harnwell, President of the University of Pennsylvania. John S. Coleman, Executive Secretary of the Division of Physical Sciences and formerly Executive Secretary of the Committee on Undersea Warfare, received the Navy Meritorious Public Service Award.

STAFF APPOINTMENTS

The Maritime Cargo Transportation Conference announces the appointment of **Ernest S. Valfer** and **Mrs. Rebecca Plender** to the working staff of the San Francisco Port Study. Mr. Valfer, an industrial engineer formerly with the U. S. Naval Air Station, Alameda, Calif., received his M.S. degree in industrial engineering from the University of California at Berkeley in 1952 and has been working with the group on loan from the Navy for the past year. Mrs. Plender is a graduate of Vanderbilt University and before joining the San Francisco Port Study staff as a statistical analyst, was employed by the Northrop Aircraft Company as an associate engineer.

Robert E. Green has been appointed Assistant Executive Director of the Advisory Board on Education to serve as a specialist on the use of films and television in education. Mr. Green received his M.A. degree from Kansas State Teachers College in 1952, and from 1955 to 1958 he was Director, Department of Education, Dage Television Division, Thompson-Ramo Wooldridge, Inc. Mr. Green will work with the recently appointed Film and Television Committees of the Division of Mathematics and the American Geological Institute and will maintain liaison with similar committees of professional organizations.

COOPERATING SOCIETIES

The following list of Societies cooperating with the National Academy of Sciences-National Research Council has been taken from the Library publication "Cooperating Societies, National Academy of Sciences-National Research Council, Officers and Meetings" revised September 1958. A limited number of copies of this publication are available upon request from the Librarian of the Academy-Research Council. Representatives of these societies serve as members of the Divisions which are shown in parentheses after the name of the society.

ACOUSTICAL SOCIETY OF AMERICA (Physical Sciences)

AMERICAN ACADEMY OF NEUROLOGY (Medical Sciences)

AMERICAN ACADEMY OF PEDIATRICS (Medical Sciences)

AMERICAN ANTHROPOLOGICAL ASSOCIATION (Anthropology and Psychology)

AMERICAN ASSOCIATION OF ANATOMISTS (Biology and Agriculture, and Medical Sciences)

AMERICAN ASSOCIATION OF IMMUNOLOGISTS (Medical Sciences)

AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS (Medical Sciences)

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (Earth Sciences)

AMERICAN ASTRONOMICAL SOCIETY (Physical Sciences)

AMERICAN CERAMIC SOCIETY, INCORPORATED (Chemistry and Chemical Technology)

AMERICAN CHEMICAL SOCIETY (Chemistry and Chemical Technology)

AMERICAN COLLEGE OF PHYSICIANS (Medical Sciences)

AMERICAN COLLEGE OF SURGEONS (Medical Sciences)

AMERICAN CONGRESS ON SURVEYING AND MAPPING (Earth Sciences)

AMERICAN CRYSTALLOGRAPHIC ASSOCIATION (Physical Sciences)

AMERICAN DAIRY SCIENCE ASSOCIATION (Biology and Agriculture)

AMERICAN DENTAL ASSOCIATION (Medical Sciences)

AMERICAN FEDERATION FOR CLINICAL RESEARCH (Medical Sciences)

AMERICAN GENETIC ASSOCIATION (Biology and Agriculture)

AMERICAN GEOGRAPHICAL SOCIETY (Earth Sciences)

AMERICAN GEOPHYSICAL UNION (Earth Sciences and Physical Sciences)

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS (Chemistry and Chemical Technology, and Engineering and Industrial Research)

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS (Engineering and Industrial Research)

AMERICAN INSTITUTE OF MINING, METALLURGICAL AND PETROLEUM ENGINEERS (Engineering and Industrial Research)

AMERICAN INSTITUTE OF NUTRITION (Biology and Agriculture)

AMERICAN INSTITUTE OF PHYSICS (Physical Sciences)

AMERICAN IRON AND STEEL INSTITUTE (Engineering and Industrial Research)

AMERICAN MATHEMATICAL SOCIETY (Mathematics)

AMERICAN MEDICAL ASSOCIATION (Medical Sciences)

AMERICAN METEOROLOGICAL SOCIETY (Earth Sciences and Physical Sciences)

AMERICAN NEUROLOGICAL ASSOCIATION (Medical Sciences)

AMERICAN OIL CHEMISTS' SOCIETY (Chemistry and Chemical Technology)

AMERICAN PHYSICAL SOCIETY (Mathematics and Physical Sciences)

AMERICAN PHYSIOLOGICAL SOCIETY (Biology and Agriculture, and Medical Sciences)

AMERICAN PHYTOPATHOLOGICAL SOCIETY (Biology and Agriculture)

AMERICAN PSYCHIATRIC ASSOCIATION (Medical Sciences)

AMERICAN PSYCHOLOGICAL ASSOCIATION (Anthropology and Psychology)

AMERICAN PUBLIC HEALTH ASSOCIATION (Medical Sciences)

AMERICAN ROENTGEN RAY SOCIETY (Medical Sciences)

AMERICAN SOCIETY FOR CLINICAL INVESTIGATION (Medical Sciences)

AMERICAN SOCIETY FOR ENGINEERING EDUCATION (Engineering and Industrial Research)

AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY (Medical Sciences)

AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE (Biology and Agriculture)

AMERICAN SOCIETY FOR METALS (Engineering and Industrial Research)

AMERICAN SOCIETY FOR PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS (Medical Sciences)

AMERICAN SOCIETY FOR TESTING MATERIALS (Engineering and Industrial Research)

AMERICAN SOCIETY OF AGRONOMY (Biology and Agriculture)

AMERICAN SOCIETY OF ANIMAL PRODUCTION (Biology and Agriculture)

AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS (Biology and Agriculture, Chemistry and Chemical Technology, and Medical Sciences)

AMERICAN SOCIETY OF CIVIL ENGINEERS (Engineering and Industrial Research)

AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS (Engineering and Industrial Research)

AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS (Biology and Agriculture)

AMERICAN SOCIETY OF LIMNOLOGY AND OCEANOGRAPHY (Biology and Agriculture)

AMERICAN SOCIETY OF MAMMALOGISTS (Biology and Agriculture)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (Engineering and Industrial Research)

AMERICAN SOCIETY OF PARASITOLOGISTS (Biology and Agriculture)

AMERICAN SOCIETY OF PHOTOGRAHAMMETRY (Earth Sciences)

AMERICAN SOCIETY OF PLANT PHYSIOLOGISTS (Biology and Agriculture)

AMERICAN SOCIETY OF PLANT TAXONOMISTS (Biology and Agriculture)

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS (Engineering and Industrial Research)

AMERICAN SOCIETY OF TROPICAL MEDICINE AND HYGIENE (Medical Sciences)

AMERICAN SOCIETY OF ZOOLOGISTS (Biology and Agriculture)

AMERICAN SURGICAL ASSOCIATION (Medical Sciences)

AMERICAN VETERINARY MEDICAL ASSOCIATION (Biology and Agriculture, and Medical Sciences)

AMERICAN WELDING SOCIETY (Engineering and Industrial Research)

ASSOCIATION FOR COMPUTING MACHINERY (Mathematics)

ASSOCIATION FOR SYMBOLIC LOGIC (Mathematics)

ASSOCIATION OF AMERICAN GEOGRAPHERS (Earth Sciences)

ASSOCIATION OF AMERICAN PHYSICIANS (Medical Sciences)

BIOMETRIC SOCIETY, EASTERN NORTH AMERICAN REGION (Biology and Agriculture, and Mathematics)

BOTANICAL SOCIETY OF AMERICA, INCORPORATED (Biology and Agriculture)

ECOLOGICAL SOCIETY OF AMERICA (Biology and Agriculture)

ECONOMETRIC SOCIETY (Mathematics)

ELECTROCHEMICAL SOCIETY, INCORPORATED (Chemistry and Chemical Technology)

ENGINEERING FOUNDATION (Engineering and Industrial Research)

ENTOMOLOGICAL SOCIETY OF AMERICA (Biology and Agriculture)

GENETICS SOCIETY OF AMERICA (Biology and Agriculture)

GEOCHEMICAL SOCIETY (Chemistry and Chemical Technology, and Earth Sciences)

GEOLOGICAL SOCIETY OF AMERICA (Earth Sciences)

ILLUMINATING ENGINEERING SOCIETY (Engineering and Industrial Research)

INDUSTRIAL RESEARCH INSTITUTE (Engineering and Industrial Research)

INSTITUTE OF MATHEMATICAL STATISTICS (Mathematics)

INSTITUTE OF RADIO ENGINEERS (Engineering and Industrial Research)

INSTITUTE OF THE AERONAUTICAL SCIENCES (Engineering and Industrial Research)

INSTITUTE OF TRAFFIC ENGINEERS (Engineering and Industrial Research)

INSTRUMENT SOCIETY OF AMERICA (Engineering and Industrial Research)

MATHEMATICAL ASSOCIATION OF AMERICA (Mathematics)

MINERALOGICAL SOCIETY OF AMERICA (Earth Sciences)

MYCOLOGICAL SOCIETY OF AMERICA (Biology and Agriculture)

OPERATIONS RESEARCH SOCIETY OF AMERICA (Mathematics)

OPTICAL SOCIETY OF AMERICA (Physical Sciences)

PALEONTOLOGICAL SOCIETY (Biology and Agriculture, and Earth Sciences)

POULTRY SCIENCE ASSOCIATION (Biology and Agriculture)

SEISMOLOGICAL SOCIETY OF AMERICA (Earth Sciences)

SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS (Mathematics)

SOCIETY FOR PEDIATRIC RESEARCH (Medical Sciences)

SOCIETY FOR THE STUDY OF DEVELOPMENT AND GROWTH (Biology and Agriculture)

SOCIETY OF AMERICAN BACTERIOLOGISTS (Biology and Agriculture, and Medical Sciences)

SOCIETY OF AMERICAN FORESTERS (Biology and Agriculture)

SOCIETY OF AUTOMOTIVE ENGINEERS, INCORPORATED (Engineering and Industrial Research)

SOCIETY OF ECONOMIC GEOLOGISTS (Earth Sciences)

SOCIETY OF ECONOMIC PALEONTOLOGISTS AND MINERALOGISTS (Earth Sciences)

SOCIETY OF EXPLORATION GEOPHYSICISTS (Earth Sciences)

SOCIETY OF GENERAL PHYSIOLOGISTS (Biology and Agriculture)

SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS (Engineering and Industrial Research)

SOCIETY OF PHOTOGRAPHIC SCIENTISTS AND ENGINEERS (Engineering and Industrial Research)

SOCIETY OF SYSTEMATIC ZOOLOGY (Biology and Agriculture)

SOCIETY OF VERTEBRATE PALEONTOLOGY (Earth Sciences)

SOIL SCIENCE SOCIETY OF AMERICA (Biology and Agriculture)

WILDLIFE SOCIETY (Biology and Agriculture)

RECORD OF MEETINGS

September	September
3	Committee on Cartography, Advisory to the Department of State. International Conference on Scientific Information, Local Arrangements Committee
3-5	Conference on Non-Crystalline Solids, <i>Alfred, N. Y.</i>
4	Advisory Committee for Project on Metallurgical Variables and Drop-Weight Test
	Titanium Sheet Rolling Panel, Heat Treatment Sub-panel, <i>Chicago</i>
	Committee on International Scientific Unions
	Steering Committee for Urban Research
4-5	Conference on Physical and Chemical Properties of Sea Water, <i>Easton, Md.</i>
5	Federal Construction Council, Task Group on Air Conditioning Design
	Conference to Review Consultant-Committee Report on Proposed Atomic Bomb Casualty Commission Ageing Program
	Planning Committee for Noise Control Conference, <i>New York City</i>
9	Planning Committee for Conference on Building Illumination
10	Maritime Cargo Transportation Conference, Steering Committee
10-11	Titanium Sheet Rolling Panel, Sub-panel on Uniform Design Data, <i>New York City</i>
12	International Conference on Scientific Information, Conference Committee
	Refractory Metals Panel on Chromium, Raw Materials Group
15	Refractory Metals Panel on Tungsten, Applications Group, <i>New York City</i>
15-16	Working Group on Disposal of Radioactive Wastes from Nuclear Powered Ships
	Working Group on Disposal of Low Level Radioactive Wastes off the West Coast, <i>La Jolla, Calif.</i>
15-18	Conference on Penetration of Charged Particles Through Matter, <i>Gatlinburg, Tenn.</i>
16	Materials Advisory Board, Meeting of Panel Chairmen and Vice Chairmen
17	Plastics Study Group, Planning Committee
17-18	Conference on Installation and Maintenance of Resilient Smooth-Surface Flooring
	Panel on Ocean Resources
	September 18
	Building Research Advisory Board, Technical Studies Advisory Committee
	Conference on Laboratory Animal Transportation, <i>Bethesda, Md.</i>
	Committee on Soil and Water Conservation, <i>Madison, Wis.</i>
	Protocol Meeting of Committee on Ultraviolet Light Study
	Building Research Institute, Programs Committee
	Refractory Metals Panel on Tungsten, Raw Materials Group, <i>San Francisco, Calif.</i>
	Panel on Casing Materials and Panel on Nozzles and Controls of Solid Propellant Rocket Motors, Joint Meeting
	Committee on Materials for AASHO Road Test
	Institute of Laboratory Animal Resources, Committee on Animal Diseases, <i>Bethesda, Md.</i>
	Committee on Textile Fabrics, <i>New York City</i>
	Committee on Guardrails and Guideposts, <i>Milford, Mich.</i>
	International Conference on Scientific Information, Local Arrangements Committee
	Refractory Metals Group on Molybdenum, Raw Materials Group, <i>San Francisco</i>
	Materials Advisory Board, Committee on Information Dissemination
	Subcommittee on Food Technology and Liaison Panel Representatives of Trade Associations and Foundations, Joint Meeting, <i>Hershey, Pa.</i>
	National Science Foundation, Postdoctoral Fellowship Committee
	U. S. National Committee for International Union Against Cancer
	National Science Foundation, Postdoctoral Fellowship Board
	Project Advisory Committee for SR-128 "Ships at Sea"
	October 1
	Titanium Sheet Rolling Panel, Evaluation Sub-panel, <i>Seattle</i>
	Steering Committee for Urban Research
	Committee on Ship Steel
	Titanium Sheet Rolling Panel, <i>Seattle</i>
	Special Moho Committee
	National Conference on Highways and Urban Development, <i>Sagamore, N. Y.</i>

October	October
7	Committee on Sanitary Engineering and Environment
8	Federal Construction Council, Operating Committee
9	Refractory Metals Panel on Columbium and Tantalum, Applications Group, <i>Chicago</i>
	Committee on Nuclear Data
	U. S. National Committee, International Union of Pure and Applied Chemistry
9-10	Committee on Geography, Advisory to Office of Naval Research, <i>Gaithersburg, Md.</i>
	U. S. Program Committee for International Conference on Information Processing
10	Subcommittee on Nuclear Geophysics, <i>Chicago</i>
	Subcommittee on Waste Disposal
	Subcommittee on Thermal Factors in Environment, Conference on Solar Heat Loads
11	Committee on Mathematics, Advisory to the Office of Naval Research, <i>New York City</i>
	Division of Earth Sciences, Executive Committee
	Division of Biology and Agriculture, Executive Committee
11-12	Committee on Oceanography, <i>Seattle</i>
12	National Academy of Sciences-National Research Council, Governing Board
	Agricultural Board
	Agricultural Research Institute Governing Board and Agricultural Board, Joint Meeting
13	Committee on Waste Disposal, Advisory to Atomic Energy Commission
	International Conference on Scientific Information, Program Committee
	Maritime Research Advisory Committee
13-14	Agricultural Research Institute, Annual Meeting
14	Manufacturing Methods Sub-panel on Rolling, <i>Pittsburgh</i>
	Committee on Soil and Water Conservation
	Titanium Sheet Rolling Sub-panel on Rolling, <i>Niles, Ohio</i>
15	Titanium Sheet Rolling Sub-panel on Rolling, <i>Toronto, Ohio</i>
	Committee on Africa South of the Sahara
	Advisory Board on Education
	Plastics Study Group, Information Advisory Task Group, <i>Princeton, N. J.</i>
16	Titanium Sheet Rolling Sub-panel on Rolling, <i>Midland, Pa.</i>
	Committee on Textile Fabrics, <i>Framingham, Mass.</i>
	Subcommittee on Blood Coagulation
	National Advisory Committee for AASHO Road Test, <i>LaSalle, Ill.</i>
	Committee on Solid Propellant Rocket Motors, <i>Pittsburgh</i>
	Conference on Military Applications of Fabrics for Coating, <i>Natick, Mass.</i>
	Subcommittee on Transfusion Problems
	Subcommittee on Radiobiology
	Steering Committee for Urban Research
	Titanium Sheet Rolling Sub-panel on Rolling, <i>Massillon, Ohio</i>
	Titanium Sheet Rolling Panel, Alloy Selection Sub-panel
	Committee on Blood and Related Problems
	Committee on Photobiology
	U. S. National Committee, International Union of Biochemistry
	Committee on Atmospheric Sciences
	Ship Structure Committee, Subcommittee on Ultrasonics
	Committee on Large Solid Propellant Rocket Motors, Panel on Engineering and Production Methods
	Chairmen of Advisory Committees to National Bureau of Standards
	Conference on Agricultural Pests
	U. S. National Committee, International Scientific Radio Union, <i>University Park, Pa.</i>
	Seventh National Clay Conference
	Committee on Agricultural Pests
	Committee on Highway Safety Research, <i>Chicago</i>
	Committee on Climatology, Advisory to Weather Bureau, <i>New Haven, Conn.</i>
	International Conference on Scientific Information, Local Arrangements Committee
	Nuclear Data Group
	U. S. National Committee, International Geophysical Year
	Refractory Metals Panel on Columbium, Raw Materials Group
	Advisory Committee on Civil Defense
	U. S. National Committee, International Union of Biochemistry
	Armed Forces-National Research Council Committee on Hearing and Bio-Acoustics, Executive Council
	Subcommittee on Oncology
	Steering Committee for Urban Research

October	October	
27-28	Institute of Laboratory Animal Resources, Committee on Production, <i>Clinton, Tenn.</i>	
28	International Conference on Scientific Information, Committee on Local Arrangements	
	Planning Committee for Adhesives and Sealants	
28-29	Armed Forces-National Research Council Committee on Hearing and Bio-Acoustics	
29	Armed Forces-National Research Council Committee on Vision	
	Conference on Building Illumination, Planning Committee, <i>Cleveland, Ohio</i>	
30	Armed Forces-National Research Council Committee on Hearing and Bio-Acoustics and Committee on Vision, Joint Meeting of Executive Councils	
	30	Food Protection Committee and Industry Committee, Joint Meeting
	U. S. National Committee, International Union of Nutritional Sciences	
	Organizing Committee for 5th International Congress on Nutrition	
	Hospitality Committee for 5th International Congress on Nutrition	
	Committee on Cereals	
	Committee on Military Psychology	
	Committee on the Cardiovascular System, Planning Subcommittee	
	Ladies Committee for 5th International Congress on Nutrition	
	Food and Nutrition Board	
	Committee on Solid Propellant Rocket Motors, Panel on Nozzles and Controls, <i>Sacramento</i>	
	31	31-Nov. 1

NEW PUBLICATIONS

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Bureau of State Services, Communicable Disease Center, 1958. [213] p.

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Notice of Academy Meetings

NATIONAL ACADEMY OF SCIENCES

Annual Meeting, Washington, D. C., April 27-29, 1959

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL

Governing Board, Washington, D. C., February 8, 1959

Governing Board, Washington, D. C., April 26, 1959

Governing Board, Washington, D. C., June 13, 1959

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